

AMENDMENTS TO THE CLAIMS

1. (Currently Amended) A probe for measuring an electric potential of a cell, said probe being configured for use with a sucking device, said probe comprising:

a plate having a surface;

a first cavity provided in the surface of the plate, the first cavity having a bottom surface;

a second cavity provided in the bottom surface of the first cavity;

a first flow passage provided in the plate, the first flow passage having a first opening and a second opening, the first opening of the first flow passage opening to the second cavity, the second opening of the first flow passage opening outside the plate;

a second flow passage provided in the plate, the second flow passage having a first opening and a second opening, the first opening of the second flow passage opening to the second cavity, the second opening of the second flow passage opening outside the plate;

a sensor element provided in the first cavity, the sensor element including a thin plate and a supporting substrate, the thin plate having a first surface and a second surface opposite to the first surface;

a through-hole provided in the thin plate, the through-hole having a first opening which opens to the first surface of the thin plate and a second opening which opens to the second surface of the thin plate and the second cavity of the ~~plate, plate;~~

a measuring stick having a first end and a second end, the first end being connected with the ~~plate; and plate;~~

a first tube having a first end connected to the second opening of the first flow passage and having a second end opposite to the first end of the first tube, the first tube extending along the measuring stick to the second end of the measuring stick; and

a second tube having a first end connected to the second opening of the second flow passage and having a second end opposite to the first end of the second tube, the second tube extending along the measuring stick to the second end of the measuring stick,

wherein the supporting substrate of the sensor element is provided in the first cavity of the plate,

wherein the first flow passage is configured to allow fluid to flow ~~in~~ from the first tube into the plate through the second opening of the first flow passage, and

~~wherein such that~~ the sucking device is operable to suck the fluid flowing in the first flow ~~passage- passage through the second end of the second flow passage and through the second tube so as to hold the cell on the first opening of the through-hole of the thin plate.~~

2. (Previously Presented) The probe of claim 1, wherein the bottom surface of the first cavity and the second surface of the thin plate of the sensor element are flush with each other.

3. (Previously Presented) The probe of claim 2, wherein

the supporting substrate of the sensor element has a first surface and a second surface, the first surface of the supporting substrate facing in a direction identical to a direction which the surface of the plate faces, the second surface of the supporting substrate being provided on the bottom surface of the first cavity of the plate, and

a third cavity is provided on the first surface of the thin plate.

4. (Previously Presented) The probe of claim 1, wherein the supporting substrate of the sensor element is bonded to the plate.

5-6. (Cancelled)

7. (Previously Presented) The probe of claim 5, further comprising a valve, wherein the second opening of the second flow passage is configured to be coupled to a pouring device, and the valve is configured to be connected between the pouring device and the second flow passage.

8. (Previously Presented) The probe of claim 5, wherein the second flow passage has a sectional area not smaller than 0.01mm^2 .

9. (Previously Presented) The probe of claim 5, wherein the second flow passage has a curved portion.

10. (Previously Presented) The probe of claim 5, wherein the plate includes a bump which is provided between the first flow passage and the second flow passage, the bump projecting toward the second cavity.

11. (Previously Presented) The probe of claim 1, wherein the first flow passage has a sectional area not smaller than 0.01mm^2 .

12. (Previously Presented) The probe of claim 1, wherein the first flow passage has a curved portion.

13. (Previously Presented) The probe of claim 1, further comprising electrodes provided on the sensor element around the first opening of the through-hole and the second opening of the through-hole, respectively.

14. (Previously Presented) The probe of claim 1, further comprising
at least one pocket, each pocket of the at least one pocket being provided on at least one of the first opening of the through-hole and the second opening of the through-hole of the thin plate, each pocket of the at least one pocket having a diameter larger than a diameter of the through-hole of the thin plate.

15. (Previously Presented) The probe of claim 1, wherein the plate comprises a material which transmits light.

16. (Previously Presented) The probe of claim 1, wherein the thin plate of the sensor element comprises a material which transmits light.

17. (Previously Presented) The probe of claim 1, wherein the plate includes a bump projecting toward the second cavity.

18. (Previously Presented) The probe of claim 1, wherein the surface of the plate and the first surface of the thin-plate of the sensor element are flush with each other.

19. (Previously Presented) The probe of claim 18, wherein

the supporting substrate of the sensor element has a first surface and a second surface, the first surface of the supporting substrate facing in a direction identical to a direction which the surface of the plate faces, the second surface of the supporting substrate is provided on the bottom surface of the first cavity of the plate, and

a third cavity is provided on the first surface of the thin plate.

20-33. (Cancelled)

34. (Currently Amended) The probe of ~~claim 5,~~ claim 1, wherein the second opening of the second flow passage is configured to be coupled to a pouring device for supplying fluid into the second opening of the second flow passage.

35. (Previously Presented) The probe of claim 15, wherein the material of the plate transmits light such that the second cavity can be monitored from below the surface of the plate.

36. (Previously Presented) The probe of claim 16, wherein the material of the thin plate transmits light such that the second cavity can be monitored from above the surface of the plate.

37. (Previously Presented) The probe of claim 1, wherein the measuring stick extends away from the plate such that the probe can be submerged in a culture solution with the measuring stick extending through the surface of the culture solution.

38. (Previously Presented) The probe of claim 1, wherein the tube extends from the first end of the measuring stick to the second end of the measuring stick.

39. (Previously Presented) The probe of claim 1, wherein the second opening of the first flow passage is configured to be coupled to the sucking device so as to suck the fluid in the first flow passage.

40. (Currently Amended) A probe for measuring an electric potential of a cell, said probe being configured for use with a sucking device, said probe comprising:

- a plate having an upper surface;

- a first cavity provided in the upper surface of the plate, the first cavity having a bottom surface;

- a second cavity provided in the bottom surface of the first cavity;

- a first flow passage provided in the plate, the first flow passage having a first opening and a second opening, the first opening of the first flow passage opening to the second cavity, the second opening of the first flow passage opening outside the plate;

- a sensor element provided in the first cavity, the sensor element having a thickness substantially equal to a depth of the first cavity such that an upper surface of the sensor element is substantially flush with the upper surface of the plate and a lower surface of the sensor element contacts the bottom surface of the first cavity; and

- a through-hole provided in the sensor element such that the second cavity is in fluid communication with an external environment at the upper surface of the plate,

wherein the first flow passage is configured to allow fluid to flow in the plate such that the sucking device is operable to suck the fluid flowing in the first flow ~~passage, passage, and~~ wherein the first flow passage has a curved path including at least three switchbacks.

41. (Previously Presented) The probe of claim 40, further comprising an electrode contacting the lower surface of the sensor element and extending into the second cavity.

42. (Previously Presented) The probe of claim 41, wherein the electrode is disposed at the through-hole of the sensor element.

43. (Previously Presented) The probe of claim 40, further comprising a third cavity provided in the upper surface of the sensor element such that a thin plate is formed at the bottom surface of the sensor element, the through-hole being provided in the thin plate of the sensor element.

44. (New) The probe of claim 1, wherein the plate is operatively attached to the measuring stick, the first tube, and the second tube such that said probe can be dipped into culture solution having the cell floating therein.

45. (New) The probe of claim 1, wherein the first cavity allows the culture solution to enter in the first cavity, and

wherein the plate is arranged on the measuring stick such that the plate can be dipped in the culture solution while maintaining the second end of the measuring stick, the second end of the first tube, and the second end of the second tube outside of the culture solution.

46. (New) The probe of claim 1, wherein said probe is operable to measure the electric potential of the cell by being dipped into culture solution having the cell floating therein.

47. (New) The probe of claim 1, wherein the first tube is in fluid communication with a container, the container holding the fluid which is sucked by the sucking device.

48. (New) The probe of claim 47, further comprising a valve disposed between the container and the first tube.